Discussion 2

1. Use the **bubble sort** to sort 6, 2, 3, 1, 5, 4 showing the lists obtained at each step.

Now, use the **insertion sort** to sort this list, showing the lists obtained at each step.

Finally, use the **selection sort** to sort this list, showing the lists obtained at each step.

(cf. *Rosen 3.1 Exercises 34, 38, 41*)
2. Suppose that an element is known to be among the first four elements in a list of 32 elements. Would a linear search or a binary search locate this element more rapidly? 

(cf. Rosen 3.3 Exercise 7)

3. Consider the following pseudocode.

\[
\begin{align*}
&i := 1 & (1) \\
&t := 0 & (2) \\
&\textbf{while } i \leq n & (3) \\
&\quad t := t + i & (4) \\
&\quad i := 2i & (5)
\end{align*}
\]

Count the number of operations (as a function of \(n\)) of this program, where an operation is an addition or a multiplication (ignore the comparisons used to test the conditions in the \textbf{while} loop).

(cf. Rosen 3.3 Exercise 4)